WinCan ScanExplorer User Manual

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1 Introduction

Welcome to the **WinCan ScanExplorer Module**. This user manual gives you all necessary information how to use this module together with WinCan8. It does NOT contain any information about the creation of a scan because this depends on the scanning application. The WinCan ScanExplorer is compatible with the *DigiSewer* scanner (Module *WinCan DigiSewer*) , the *Rico RPP* scanner (Module *WinCan RPP*) and the IBAK Panoramo scanner (Module *WinCan Panoramo*).

1.1 Principle Overview

What are side scans? To understand the basic principles see the following graphic. Scanner applications such as *DigiSewer*, *Rico RPP* or *IBAK Panoramo* produce so-called side scans from the inner surface of the inspected pipe as if you would unfold the pipe into a two-dimensional image:

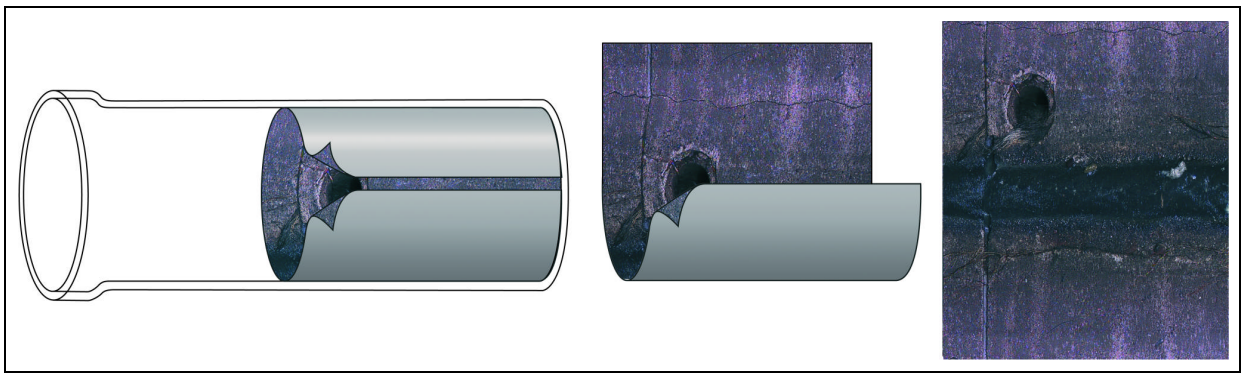


Figure 1: Unfolding the inner pipe surface into a 2D image

The advantage of this method is that you can document and view the pipe surface in one big image. Another advantage is that you can measure real distances and areas on the pipe surface which is not possible in classic video based inspection. In the first moment this unfolded pipe view may appear unusual but after a while you will see that it represents a very fast and precise view of the pipe condition.

1.2 Prerequisits

WinCan8 and the ScanExplorer module need to be installed on a standard Windows PC with the following minimal requirements:

- Microsoft Windows XP operation system
- 1 GB of RAM
- 3 GHz Intel Pentium or equivalent CPU. The ScanExplorer highly profits from multiple core processors such as the Intel Dual Core processors.
- 100 GB free hard disc space
- A 3-button mouse with mouse wheel in the centre.
- At least 2 USB-2 connectors.
- For using the ScanExplorer you need the following modules licensed in WinCan8:
  - One of the modules *DigiSewer Scanner*, *RPP Scanner* or *Panoramo Scanner*
  - One of the corresponding modules *DigiSewer ScanExplorer*, *RPP ScanExplorer* or *Panoramo ScanExplorer.*

1.3 Installation

All the required installation files can be downloaded from the WinCan web site: http://www.wincan.com and the menu Support > Updates. To have access you need a registered username and password that can be requested from support@wincan.com.

You find all the modules required for the WinCan DigiSewer under the tree menu under *Connectivity modules > WinCan Scan Technologies*:

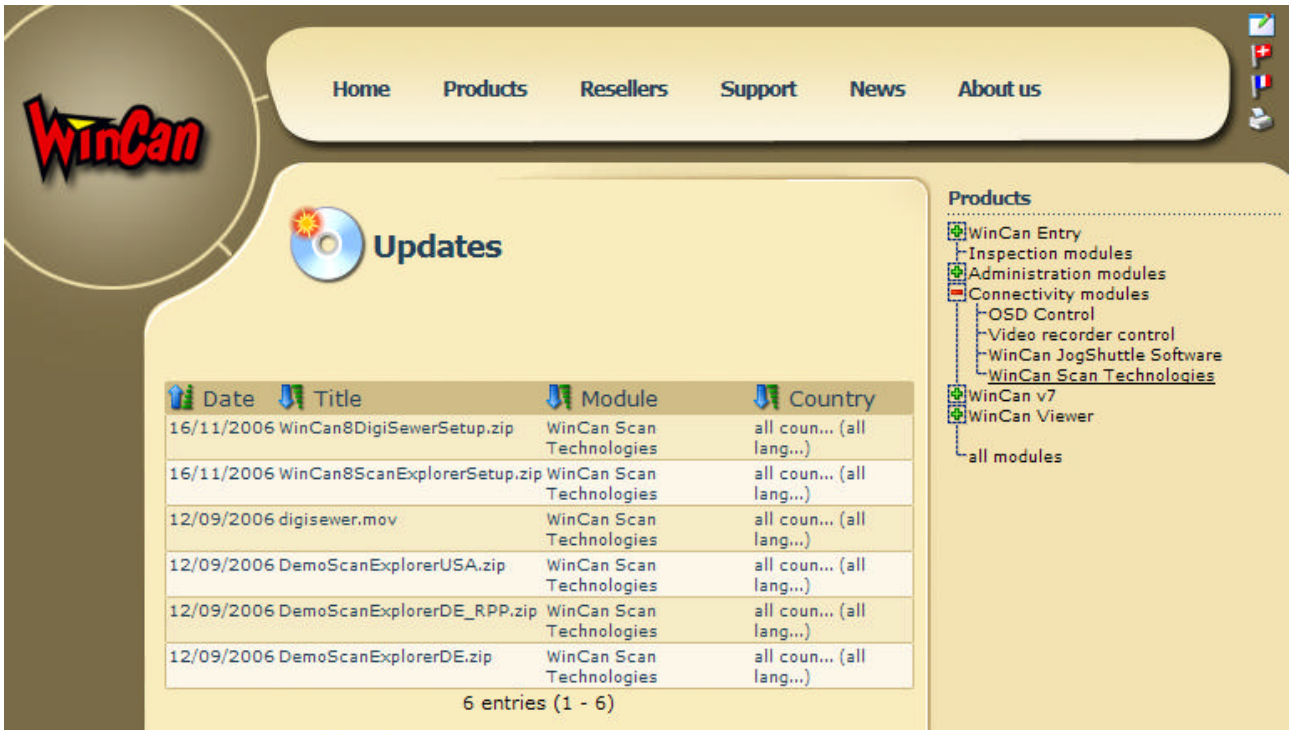


Figure 2: WinCan download page under Support > Upgrades.

1.3.1 WinCan Installation

To install the WinCan ScanExplorer module please precede the following steps that need all Administrator rights on the PC:

1. Execute the **WinCan8CoreSetup.exe**. The core setup contains all the needed windows controls, run-times, drivers and database clients. This core setup must be installed first. Reboot afterwards.
2. Execute the **WinCan8Setup.exe.** This installs the WinCan8 main application.
3. Execute the **WinCan8LangUSASetup.exe** or any other language module.
4. Execute the **DotNetFx11.exe** that installs the Microsoft DotNet framework 1.1.
5. Execute the **WinCan8ScanExplorer.exe**. This installs the Scan Explorer module into WinCan8.

For more details on WinCan8 administration and installation detail please refer to the WinCan8 administration manual.

2 Create a Scan

2.1 Starting a Scanner Application

For a tight integration of the different scanning technologies (DigiSewer, RPP and IBAK Panoramo) it is recommended to the launch the according Scanner application from within WinCan8 with the button:

If you have several scanning modules licensed a dialog appears where you have to choose the appropriate scanner application. For scanning applications in common is that specific section and inspection parameters are passed over to the scanner application and that WinCan8 is sent to sleep during the scanning process. After the scanning process WinCan8 comes back and has the scanned data in the following directory of the current WinCan8 project:

(WinCan8ProjectFolder)
> ScanExplorer
> (SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)

The subfolder *\(SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)* can not be changed. The auto numbers of section, inspection and observation where chosen for the folder name because this identifiers are always set and will remain also when sections, inspections or observations in between are deleted.

2.1.1 Starting the DigiSewer Scanning Application

Please refer to the WinCan8 DigiSewer manual for more details on this scanning application. After the scan has been created the data is stored as follows:

(WinCan8ProjectFolder)
> ScanExplorer
> (SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)
> FRONTVIEW (folder with all frontviews)
> SIDESCAN (folder with all sidescans)
> HEADER_DS2.txt (header file used to open ScanExplorer)

2.1.2 Starting the Rico RPP Scanning Application

Please refer to the Rico RPP manual for more details on this scanning application. After the scan has been created the data is stored as follows:

(WinCan8ProjectFolder)
> Video
*> *.mpg (VideoFile that was captured during the scan)*
*> *.txt (Time-distance file that was captured during the scan)*
> ScanExplorer
> (SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)
> SIDESCAN (folder with all sidescans)
> HEADER_RPP.txt (header file used to open ScanExplorer)

2.1.3 Starting the IBAK Panoramo Scanning Application

Please refer to the IBAK Panoramo manual for more details on this scanning application. After the scan has been created the data is stored as follows:

(WinCan8ProjectFolder)
> ScanExplorer
> (SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)
> Panoramo_(S#)_(I#)_(O#) (folder with the raw scan data)
> SIDESCAN (folder with all minifications of the sidescans)
> Panoramo_(S#)_(I#)_(O#).ipf (Panoramo IPF data file)
*> *.inc (inclination data file)*
> HEADER_IPF.txt (header file used to open ScanExplorer)

The Panoramo scanner application produces its raw data into the folder

Panoramo_(SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)

By default the scanner application does not generate the IPF file that is needed for the ScanExplorer and the WinCan Viewer export. You have to do this as a final step in the Panoramo scanner application.

Be aware that after the generation of the IPF file that you have stored the scanned data twice; once as raw scan files and once within the IPF file. To save disc space you have to delete the raw data folder manually.

3 Open a Scan in ScanExplorer

3.1 View the Scan Column

Before you can open or import a scan we need to show the ScanExplorer database column in the observation column. After starting WinCan8 you have to log in with a username and password and open a new WinCan project. Please refer the WinCan8 Entry manual for more details about these steps. After this the WinCan8 application screen looks as follows:

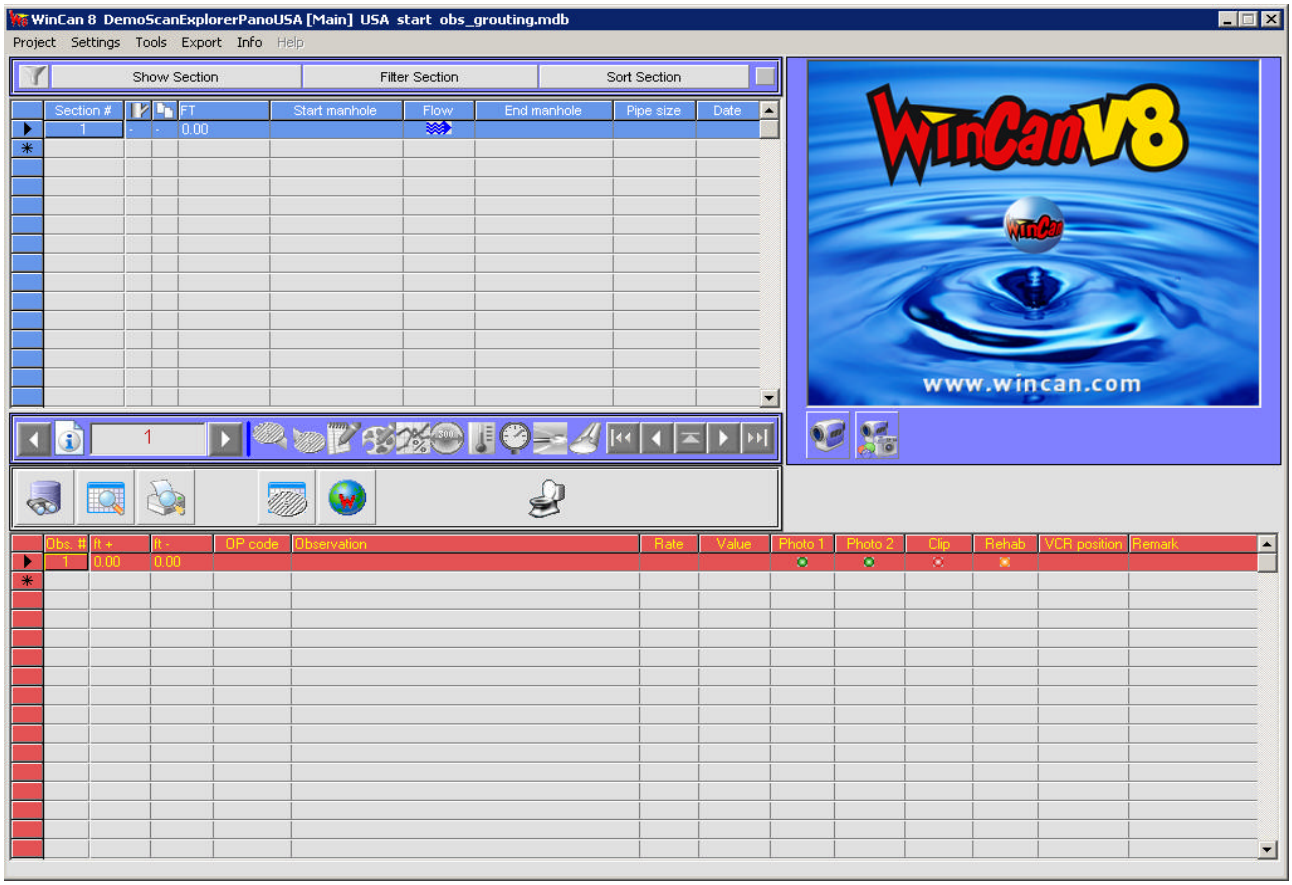

WinCan 8 DemoScanExplorerPanoUSA [Main] USA start obs_grouting.mdb
Project Settings Tools Export Info Help
Show Section
Filter Section
Sort Section
Section # FT Start manhole Flow End manhole Pipe size Date
WinCanV8
www.wincan.com
Obs. # ft + ft - OP code Observation Rate Value Photo 1 Photo 2 Clip Rehab VCR position Remark

Figure 3: WinCan8 Main Screen

Show the Scan column:

After the start-up the columns in the different grids of WinCan8 appear as they are defined in the selected template. Please read the WinCan8 Administration manual for more details about templates and their modification. After the first start-up we need to add the ScanExplorer column in the observation grid. In our example we replace the last column (MPEG Counter).

With pressed Control-Key click with the mouse pointer on the header of the column MPEG-Counter. This opens the Template-Settings dialog:

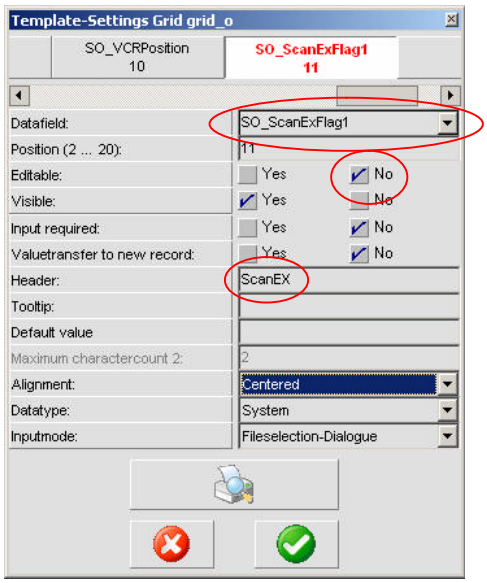


Figure 4: Template Settings dialog for the ScanExplorer column

Choose in the dropdown list of the *Data field* property the **SO_ScanExFlag1** data field. Set the *Editable* property to **No**. Set a short name (e.g. ScanEx) in the *Header* property. Click on the green OK button to close the dialog. After this the last column gets labelled ScanEx and will show you in the future a Scan Icon if a scan is attached to the observation. The new column looks like this:

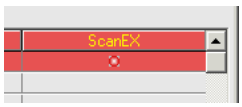


Figure 5: The ScanExplorer column for the first (empty) observation.

3.2 Import a Scan

If you did not create a scan from within WinCan8 you can import a scan either by clicking on the red bullet in the ScanExplorer column or by using the menu command *Tools > Import tScanExplorer Projects*. With a file chooser dialog you select one of the following file types:

- **HEADER_DS2.txt** (project file for DigiSewer2 scans)
- **HEADER_RPP.txt** (project file for RPP scans)
- **HEADER_IPF.txt** (project file for Panoramo scans)
- ***.ipf** (IBAK Panoramo scan files. This import automatically creates the correct HEADER_IPF.txt project file.

The import process copies the project files into the WinCan8 project folder as follows:

(WinCan8ProjectFolder)\ScanExplorer\(SectionAutoNumber)_(InspectionAutonumber)_(ObservationAutonumber)

This path is automatically generated and can not be modified.

The copy process can last a few minutes depending on the size of the scan. After the import the ScanExplorer is automatically started and in the cell where the scan is attached you can see the scan icon:

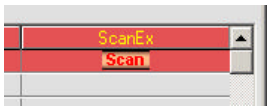


Figure 6: The scan icon indicating an attached scan.

3.3 Showing a Scan in the standalone ScanExplorer

The ScanExplorer also exists as a standalone application in the WinCan installation directory:

(Program Files)\WinCan v8\WinCan\WinCanScanExplorerStandalone.exe

With the menu command *File > Open* you can open an view a scan in the ScanExplorer but you can not create and save graphics. You can only do this when you start the ScanExplorer as component from within WinCan8.

3.4 ScanExplorer Windows and Window Layouts

3.4.1 ScanExplorer Windows

The ScanExplorer shows up in the original state with 4 windows above WinCan8 on a minimal screen size of 1024x768 pixels. The windows are:

- **Main Window**: It shows the full resolution of the unfolded sidescan image with a distance ruler on top of it an a clock hour scale on the left border of the window. On top of the sidescan you can find the toolbar and on top of this the menu bar:

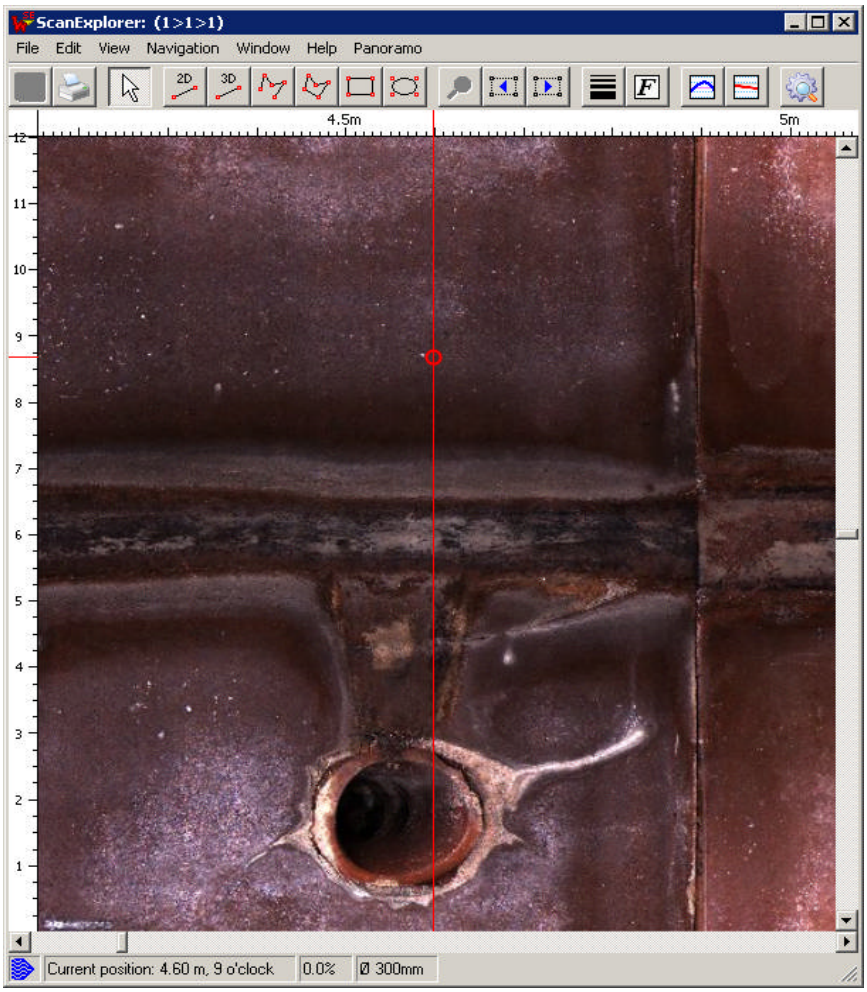


Figure 7: ScanExplorer Main Window

- **Sectionview Window**:
  - Show a vertical graphic of the section with all the graphics and their operation code.
  - Pipe and manholes are graphic symbols and are scaled to their sizes.
  - Scan direction is always top-down.
  - By default the section length is measured between the manholes. Alternatively you can set by the context menu that this length is measured between manhole centre and manhole centre.
  - The section length is transferred from WinCan to the ScanExplorer at it's startup. If there are no observations recorded in WinCan the section length is often not set. In this case the ScanExplorer calculates a section length for the section window as scan end distance minus scan start distance. As soon as observations are recorded in WinCan the section length is automatically calculated from WinCan and transferred to the ScanExplorer at it's next startup.
    The grey shaded part of the pipe in the section window signifies the scanned part of the section.

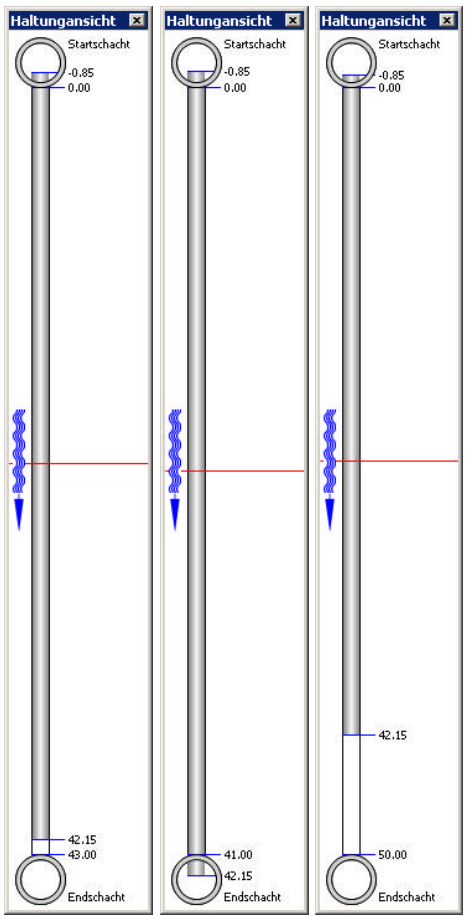


Figure 8: Section window: Picture 1: A raw scan from -0.85m to 42.15m. A provisorily length of 43m is calculated. Picture 2: After that a section length of 41m where set in WinCan. Picture 3: After that a section length of 50m where set in WinCan.

- **Frontview Window (DigiSewer)**: It shows the current frontview image that was stored ca. every 10cm during the scan. The DigiSewer scanner does not store a video.
- **Frontview Window (RPP)**: It shows the frontview video that was captured while driving forwards into the pipe
- **Frontview Window (Panoramo)**: It shows the current frontview image that is usually stored every 5 cm during the Panoramo scan. In addition you can switch between the front and the backview image taken at the same position as the frontview image.
- **Panoramo Window**: This virtual 360 degree look around view is provided through a component provided by IBAK Kiel. It allows you to smoothly move forward and backwards as well as free 360 degree rotation of the view direction.

Figure 9: DigiSewer frontview (left), RPP video frontview (middle) and the Panoramo window (right).

- **Overview Window**: It shows the minification of the unfolded side scans of the entire scan:

Figure 10: Overview Window

Effectively working with WinCan8 & ScanExplorer definitely required two screens in the dual view mode. You can work on one screen with a minimal resolution of 1024x768 but it is not recommended. If you do so you always have to switch WinCan8 or the ScanExplorer to the front or to the back.

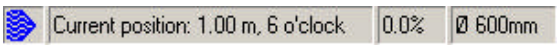
3.4.2 Window Layouts

No matter if you have one or more screens where you can position the ScanExplorer windows you can save the settings as a *Window Layout*. Beside the position different windows it will also store if a window should stay on top of all windows and if a window is open at all. All commands for the window settings can be found under the menu *Window*.

4 Navigation

4.1 Current Position

- In all windows except the Panoramo Viewer window and the video window of RPP, you can see a fine **red line** indicates the current distance in the pipe. The current clock position is marked with a little fat **red circle**.
- All windows are at all times synchronized.
- In the status bar at the lower border of all windows you can see the water flow direction and the current position:



- By default except for projects with the language USA the distances are shown with metric units. You can change this with the menu command *View > Unit > Feet*.

4.2 Changing the Position

You can change the position in many ways:

- **Left mouse button**:
  - **In the main window**: Moves the clicked position in the sidescan to the centre of the window and moves the little red circle to the according clock position. In the main window the red line that shows the current distance stays always in the centre of the window.
  - **In the overview window**: A click or a move with pressed button repositions the distance line and the little clock position circle to the clicked position in the overview window. The current clipping region from the main window is shown with a dotted red rectangle.
  - **In the frontview window of DigiSewer & Panoramo**: Moves the distance circle and the little clock position circle to the clicked spot in the frontview. If another frontview image is closer to the clicked point in the pipe that frontview image changes.
  - **In the Panoramo viewer window:** A click and the following drag change the view direction. You can look in any direction that you want. A click on the space bar resets the view to the initial straight forward view.
  - **In the frontview window of RPP**: Resumes or pauses the video frontview. With the context menu command (mouse right click) on the status bar you can turn on/off the Window Media Players control bar:

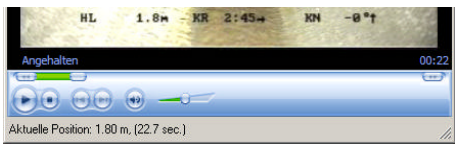


Figure 11: Windows Media Player Controls

- **Right mouse button:**
  - **In the Panoramo viewer window:** A click and drag move the current camera position forward and backwards.
  - **In all other windows:** A context menu will be opened.
- **Mouse Wheel**: Moves the current position forwards or backwards:
  - **In all windows**: The distance moved corresponds to distance between two frontviews. By default this distance is set to 10cm. Moving direction can be set with the menu command *Navigation > Mouse wheel direction (pull):*
    - Pressing the CTRL-key at the same time moves 1cm.
    - Pressing the SHIFT-key at the same time moves 1mm.
    - Pressing the ALT-key at the same time increases or decreases an automatic speed. This way the scan moves automatically without interaction.
- **Keyboard:**
  - **Key Home**: Move to the start of the scan.
  - **Key End**: Moves to the end of the scan.

- **Key PageUp/PageDown**: Moves one page in the main window forwards or backwards.
- **In the Panoramo window**: The space key resets the view to the straight forward view.

4.3 Changing the View Direction in the front window (Panoramo)

For Panoramo the frontview window is not only a frontview window but also allows viewing of backview images with exact same functionality. Additionally a *Total View* can be activated which allows 3D-viewing of the pipe as in Panoramo Viewer. This fisheye view is a combination out of the frontview and the backview:

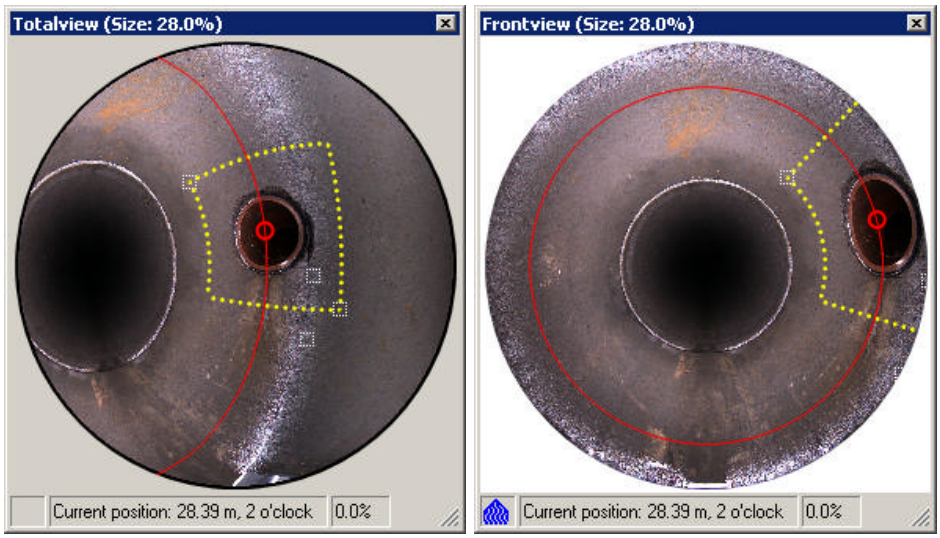


Figure 12: Left: Combined front- and backview as a total view. Right: Standard frontview

4.3.1 Entering the Total view

To enter the total view use any of the navigation options listed below. You will notice that you have entered total view when the flow direction icon at the bottom left of the windows disappears and the surrounded view circle is grey instead of white.

4.3.2 Navigating in the Total view

- **Left mouse button with CTRL-key:** Dragging while CTRL-key is pressed keeps the clicked pixel beneath the mouse pointer.
- **CTRL-key and cursors**: Looks around in pipe by 15 degrees per key press.

4.3.3 Exiting the Total view

For performance reasons it is strongly recommended you exit the Total view to navigate the Pipe.

- **Spacebar**: As in Panoramo Viewer the spacebar returns you to looking straight forward. It also exits Look Around Mode.
- **Context menu:** When either front- or backview is selected from the context menu the total view is set back to the chosen standard view.

4.4 Front- and Backview Correction (DigiSewer & Panoramo)

Sometimes the DigiSewer & Panoramo fisheye lenses are insufficiently calibrated witch leads to black borders around the front- or backview. You can correct the centre of the front- or backview by the cursor keys while pressing the ALT-key. The view radius can be adjusted with the curser left/right keys while pressing the CTRL and the ALT-keys.

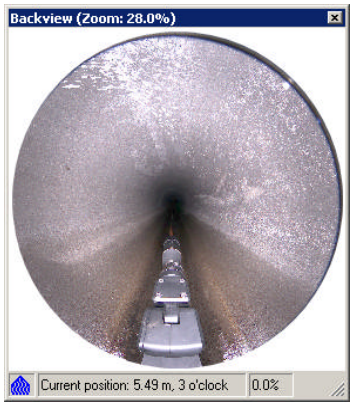


Figure 13: Insufficiently calibrated backview

4.5 Shifting along the distance ruler

The sidescans begin at a distance that was set at the scan was created. This information then is stored within the sidescan filename and can not be changed. If this start distance is not correct you can shift the sidescans along the distance ruler in the main window by pressing & moving the left mouse button within the ruler. A double click resets the original start distance.

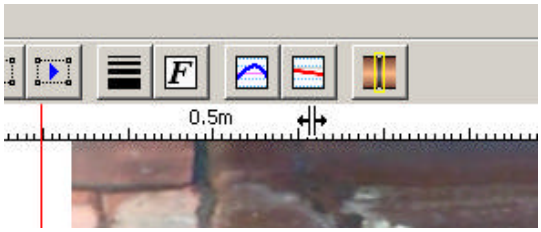


Figure 14: Shifting the sidescans along the distance ruler

4.6 Scrolling with the vertical scrollbar

By moving the vertical scrollbar you can change the cut hour of the sidescan image. The same cut hour is applied to the overview window. You can shift the sidescan this way max. +/- 6 hours. You can draw this way a graphic object over the cut hour. A double click on the vertical ruler resets the scrollbar to its default position.

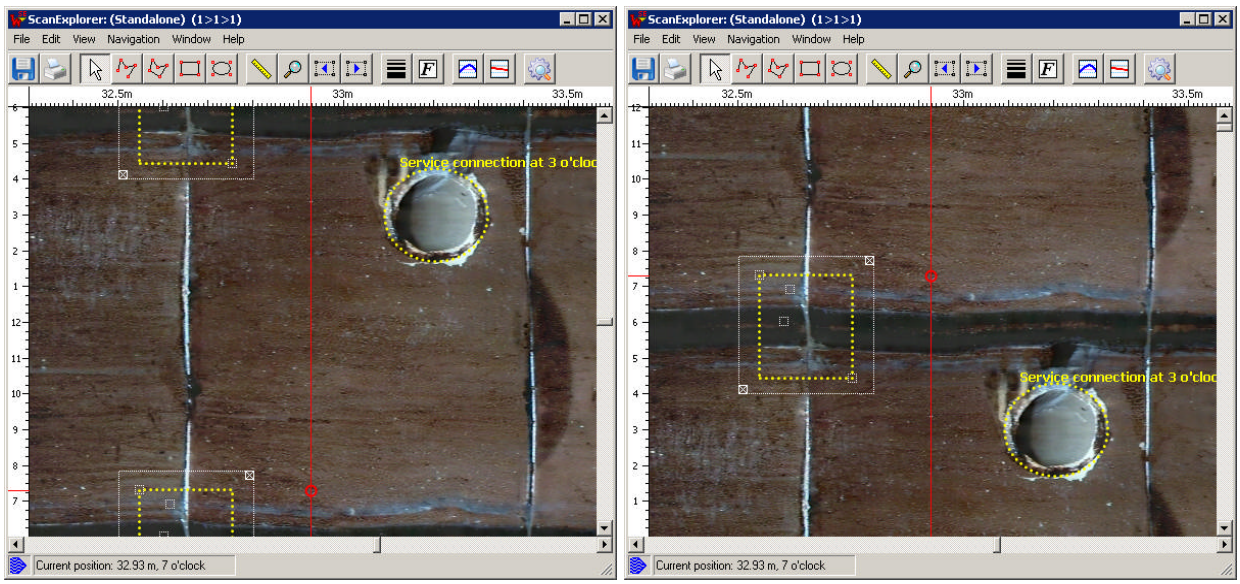


Figure 15: Left: Main window with default vertical scrollbar position. Right: The same sidescan 6 hours down scrolled. Notice the selected graphic across the cut hour of the sidescan.

4.7 Zooming

4.7.1 Zoom Lense Tool

By pressing the zoom lens button you can activate the zoom tool:

- The zoom lens is red rectangle around the current mouse position and shows the sidescan in its native resolution which means that one pixel in the scanned image is one pixel in the zoom lens.
- You can change the zoom factor in the range of 50-150% with the mouse wheel and pressing the CTRL-key at the same time.
- You can move the current sidescan section with the mouse wheel.
- Pressing the left mouse button activates the measuring tool within the zoom lens.

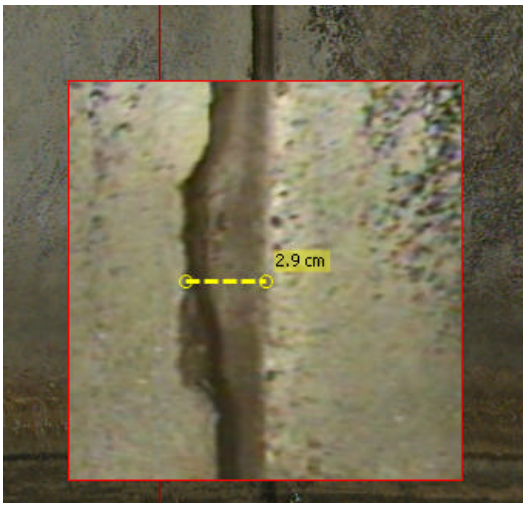


Figure 16: Zoom lens with measuring in the main window

- A ESC-key press or a click on the pointer tool ends the zooming.

4.8 Inclination & Height Chart

- By pressing the chart icon with the blue line or with the menu command *view > show inclination chart* you can add the inclination chart at the bottom of the main window.
- By pressing the chart icon with the red line or with the menu command *view > show height chart* you can add the inclination chart at the bottom of the main window.
- The inclination & the height chart are generated from the inclination values measured during the scan. At the moment only the DigiSewer system captures inclination values.
- The height chart is calculated from the inclination values. If the start and the end height in the *inspection information dialog* (*File > Inspection information*) is set to zero the height line is not corrected. Because the inclination sensors normally have an error of a certain percentage the summed up error at the end of the chart can be quite high. If you set a non-zero start and end height the height line will be corrected so that it fits into those heights.

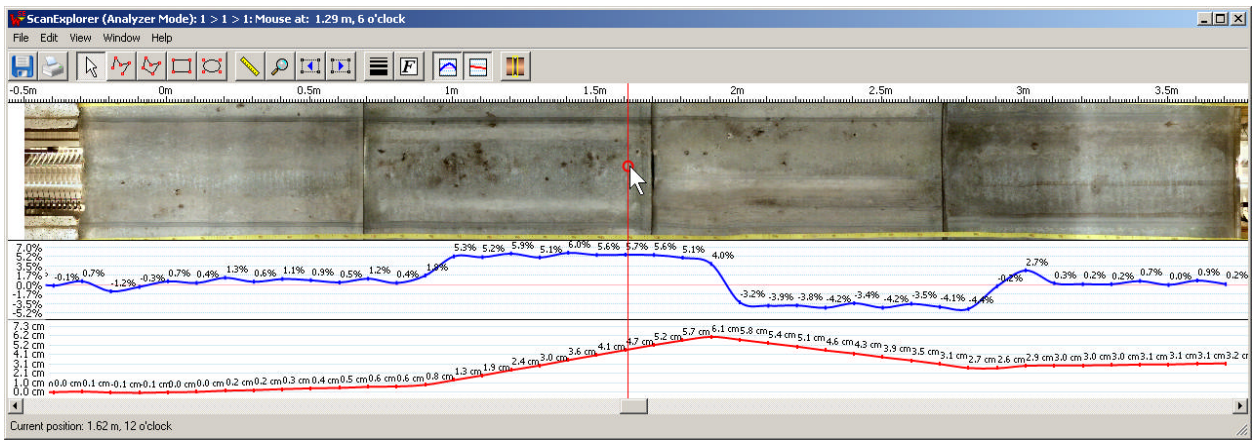


Figure 17: Main window with inclination and height chart of a horizontal (=0% inclination) test pipe. You can see at the end of the height chart a summed up error of ca. 3cm on pipe length of 4m.

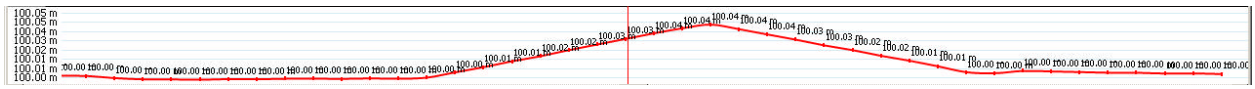


Figure 18: With a set inspection start and end height the height chart is corrected.

5 Creating Graphics & WinCan Observations

5.1 Creating Graphics

By pressing one of the drawing buttons you can activate a drawing tool:

- You can choose between the *Measure-2D*, *Measure-3D*, *Lines*, *Polygon*, *Rectangle* or the *Ellipse* drawing tool in the toolbar of the main window or in the menu *Edit*.
- By pressing the ESC-key or selecting the pointer tool you can deselect the current drawing tool and abort a new drawing.
- The difference between 2D- and 3D-measuring is that with the 2D-measuring you are measuring a distance on the unfolded 2D pipe surface. With 3D-measuring you can measure in the 3D pipe space. You can distinguish then by the endpoints. 2D-measurments have a squared endpoints where as the 3D-measurements have 2 circles as endpoints.

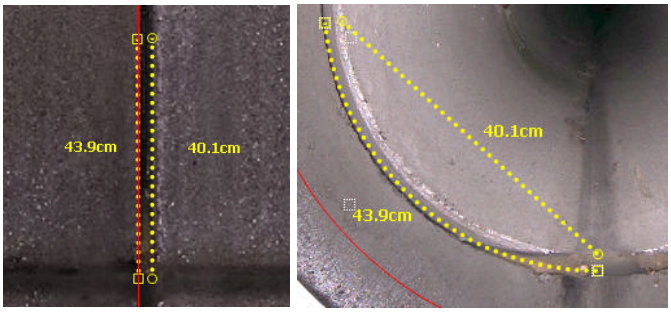


Figure 19: Different distances with 2D- and 3D-measuring. On the sidescan both measurements have the same distance (left). In the frontview you can see that the 2D-measurment is on the pipe surface, where as the 3D-measurement is a straight line in the pipe.

- You can draw in the main window or in the frontview window (DigiSewer & Panoramo).
- The drawing starts with the first press of the left mouse button.
- For lines and polygons a new point will be added on each click.
- To finish a line or a polygon you have to double-click or choose *finish graphic* from the context menu that opens on a left mouse button click.
- When the graphic is finished the *Graphic Property* dialog shows up where you can change the graphic properties:

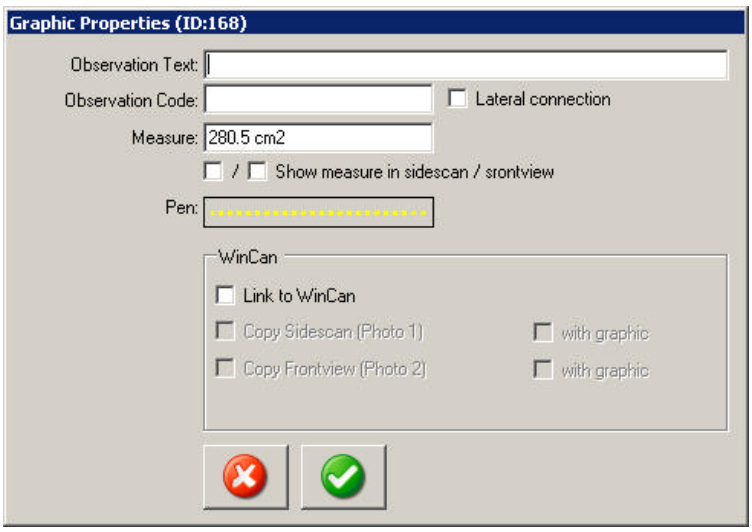


Figure 20: Dialog for the graphic properties

- Add or change a *Observation Text*.
- Add or change the *Observation Code*. If the graphic will be linked to WinCan a proposed observation code will automatically fill out all fields in WinCan's observation panel. For more information on this please read chapter 5.3 .

- Check the checkbox *Lateral Connection* if the graphic stands for a lateral connection. This draws a smaller pipe segment the Sectionview window.
- Change the visibility with *Show measure in sidescan / frontview* (a length for the measurements and the lines and an area for the rest).
- Change the *graphics* with the Pen Settings dialog:

Figure 21: The pen settings dialog with the properties pen color, width and style

- Link the graphic to a WinCan observation (see the chapter 5.3):

- The default graphics pen with which the graphics are drawn can be set with the button or over the menu command *Edit > Change pen*.
- The font with which the labels are drawn can be set globally for all graphics with the button or over the menu command *Edit > Change Font*.
- All the graphics information is stored in the project file (s. chapter 3.2) of the scan.

5.2 Selecting, Moving & Editing Graphics

- A graphic consists out of several points.
- When the graphic is selected all points are marked with a little white square. The square of the corner points have a little cross.
- Beside the points witch define the graphic itself and the bounding rectangle points each graphic contains an anker point for the label and the measure text.
- The bounding white rectangle is drawn around the points (incl. anker and corner points) and defines the rectangle of the graphic that is printed or copied to WinCan.

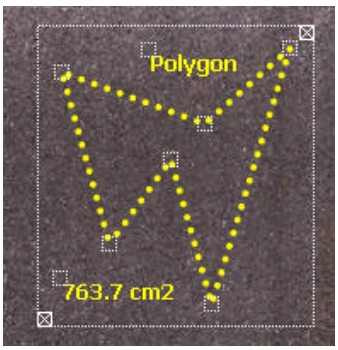


Figure 22: A selected polygon with its bounding rectangle and point squares

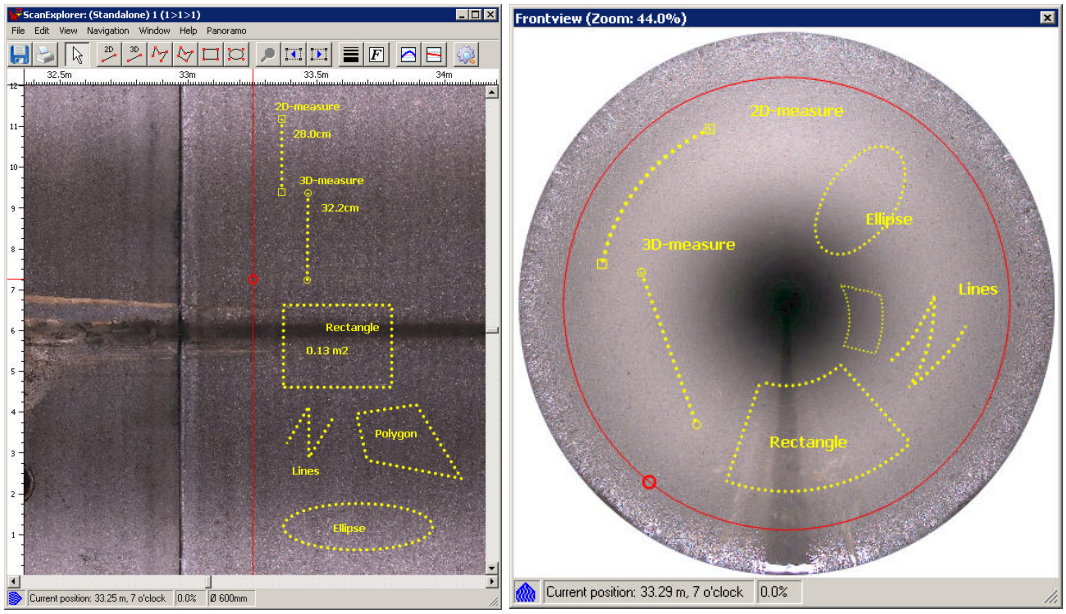


Figure 23: All graphic types in the sidescan and their correspondence in the frontview

5.2.1 Selecting a Graphic

- **In the main & frontview window**: With the arrow tool activated:
  - By clicking into the bounding rectangle of the graphic with the *right* mouse button.
  - By clicking one of the toolbar buttons . With the buttons you can position and select the next graphic to the left or the right from current position. With this method you can also select graphic that are placed upon each other.
- **In the overview window**: By clicking into graphic with the left mouse button.

5.2.2 Deselecting a Graphic

- **In the main window**: By clicking outside of the bounding rectangle with the *right* mouse button or by pressing the ESC-key.
- **In the overview window**: By clicking outside of a graphic with the left mouse button.

5.2.3 Moving, Editing and Deleteing a Graphic

- You can move a selected graphic with the pressed left mouse button.
- You can move a point of a selected graphic with the pressed left mouse button.
- You can delete a point of a selected graphic with the context menu.
- You can change the selected graphics properties in the property dialog that you can open with the context menu command *Properties* that you get with a right click on the selected graphic or by pressing the ENTER-key.
- You can delete a selected graphic with the context menu command *Delete graphic* on the selected graphic or with a press on the *Delete Key*.
- If you have moved a graphic after having copied images to WinCan you have to recheck the copy check-boxes in the property dialog to resend the images to WinCan again.
- You can delete ALL graphics with the menu command *Edit > Delete all graphics*.

5.3 Create a Graphic with a WinCan Observation

- If you want to create a graphic that is linked to an observation in WinCan8 you have to check the *Link to WinCan* checkbox in the graphics property dialog.
- If you additionally check *Copy Sidescan* it will copy an image from the bounding rectangle of the graphic in the sidescan into WinCan's *photo 1* field. Checking the checkbox *with graphic* draws the graphic into the image before copying it to WinCan. The graphic can not be removed anymore from the image.
- If you additionally check *Copy Frontview* it will copy the according frontview image into WinCan's *photo 2* field. Checking the checkbox *with graphic* (only for DigiSewer and Panoramo) draws the graphic into the image before copying it to WinCan. The graphic can not be removed anymore from the image.
- If you check *Copy Panoramo* it will copy an image from the Panoramo window into WinCan's *photo 2*.

- **After closing the property dialog in the ScanExplorer** the observation dialog from WinCan is automatically opened. The following information from the ScanExplorer are transferred to WinCan8:
  - The center position of the graphic points is used as the observations position.
  - The minimal and maximal clock position is used as the from and to clock position.
  - The photos are copied into the photo fields.
  - If an observation code was transferred and a corresponding code was found in the catalogue the observation will be filled out automatically.

- **After closing the observation panel in WinCan** the following information are transferred bach into the ScanExplorer:
  - The observation text and code
  - An information if the observation is a lateral related observation.

- **Is a graphic linked to an observation in WinCan it will have the following consequences:**
  - If you **select a graphic** in ScanExplorer it automatically activates the row of the associated observation in the observation grid and vice versa.
  - If you **move a graphic** in ScanExplorer it automatically updates the position of the observation in WinCan but NOT vice versa.
  - If you **delete a graphic** in ScanExplorer it asks you if you want to delete the associated observation in WinCan and vice versa.
  - If you **recheck the photo copy checkboxes** the photos are recopied to WinCan.

6 Printing Reports

In general you have all reports available from WinCan8 that you can configure in the *Docu-Center*: See the WinCan8 documentation for detailed information about the different reports.

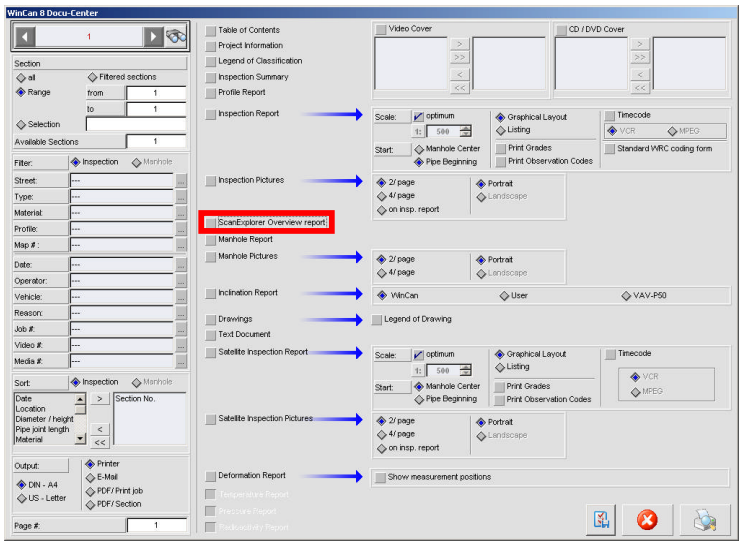


Figure 24: WinCan8 Docu-Center

6.1 ScanExplorer Overview Report in WinCan

There is one special report in the WinCan Docu-Center that is called *ScanExplorer Overview Report*. It shows the entire scan as in the overview with a distance ruler along the sidescan and an observation legend at the end of the report. The positions of the observations along the sidescan are indicated with red labels:

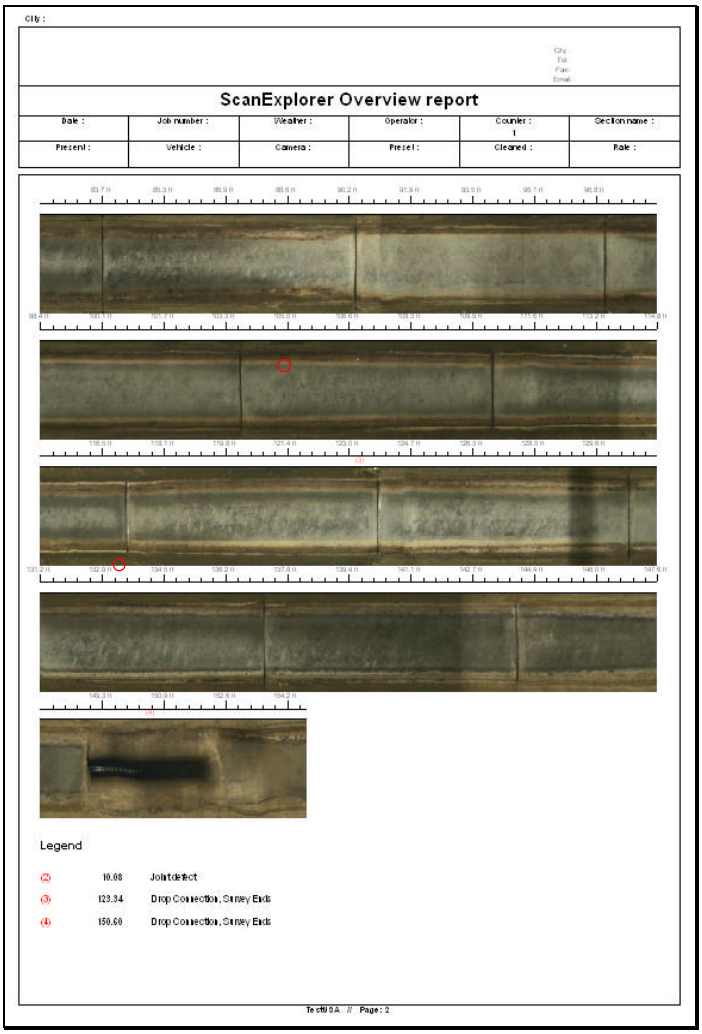


Figure 25: ScanExplorer overview report from the WinCan Docu-Center

6.2 Graphic Report in ScanExplorer

If you want to print a report about the graphics and their corresponding sidescan background you can use the *Graphics Report* from the menu *File > Print*.

- You can filter out the graphics that should be printed:
  - by a distance range
  - by a string with which the graphics label should start

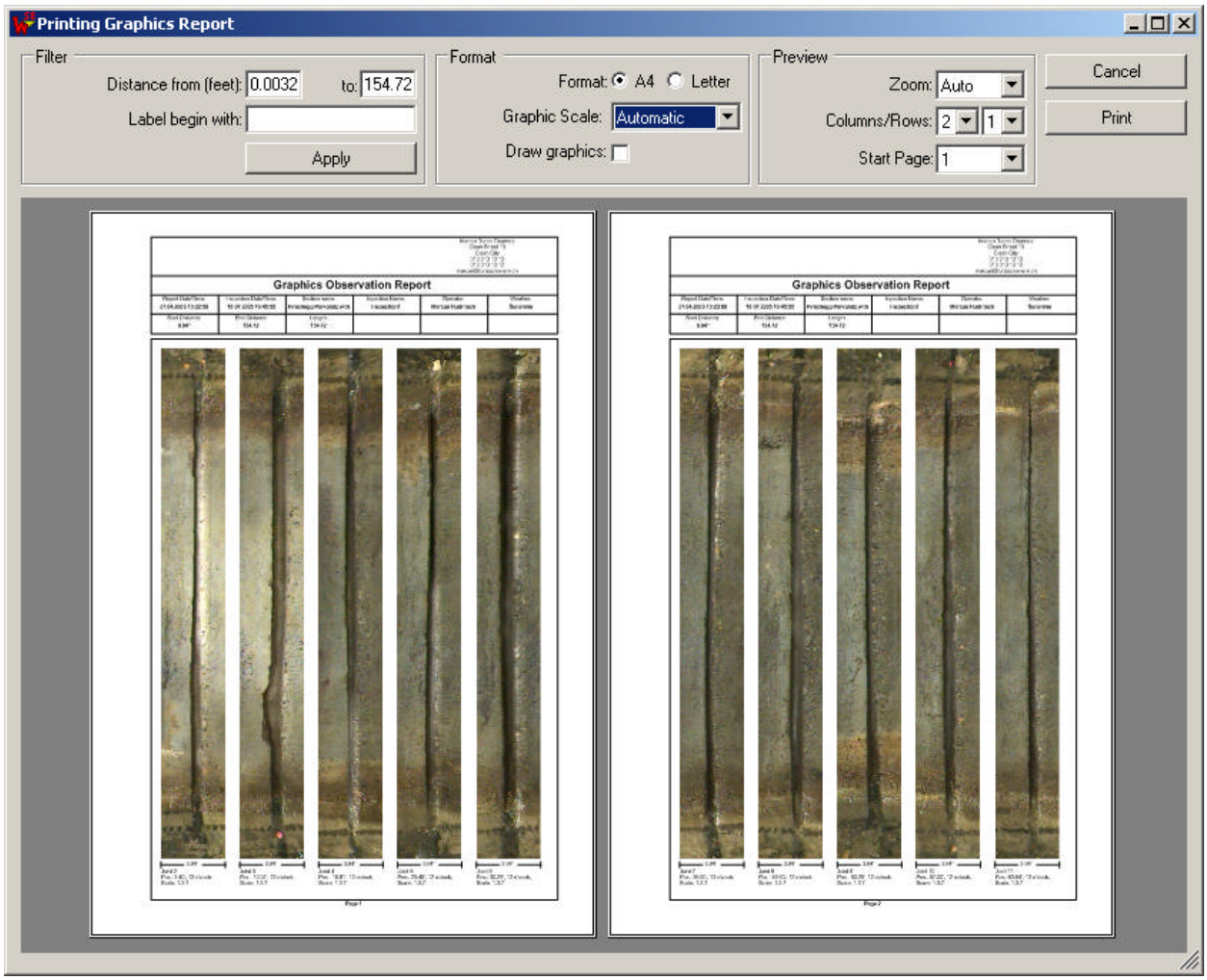


Figure 26: Graphics report with all the joints side by side.

7 ScanExplorer Post Processing (DigiSewer)

The *DigiSewer Scanner* software is producing in real-time a raw sidescan. Because the encoder wheel on the cable drum is triggering the moment when the next scan ring is unfolded two neighboring scan stripes do sometimes not perfectly fit together. Because the matching process is computational very expensive it is done in a fast but not very accurate way.

For a perfect match the ScanExplorer start the so called *ScanExplorer Post Process* after opening the scan in the ScanExplorer. The post process is a separate application that runs independently from the ScanExplorer, witch means that you can continue to work in ScanExplorer in the raw version of the scan, while the post process creates a perfectly matched scan in the background.

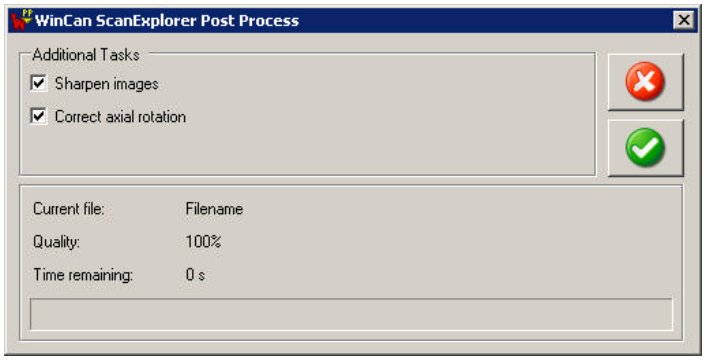


Figure 27: The window of the ScanExplorer Post Process

- Optionally you can a choose to sharpen the sidescan additionally.
- A second feature allows you to additionally correct an axial rotation of the crawler camera, that leads to curved waterline.
- When the post process is over, the ScanExplorer automatically reloads the new sidescan.
- When you are closing a post processed scan you will be asked if you want to delete the raw scan files. Click Yes if the post processed scan is better that the original raw scan.

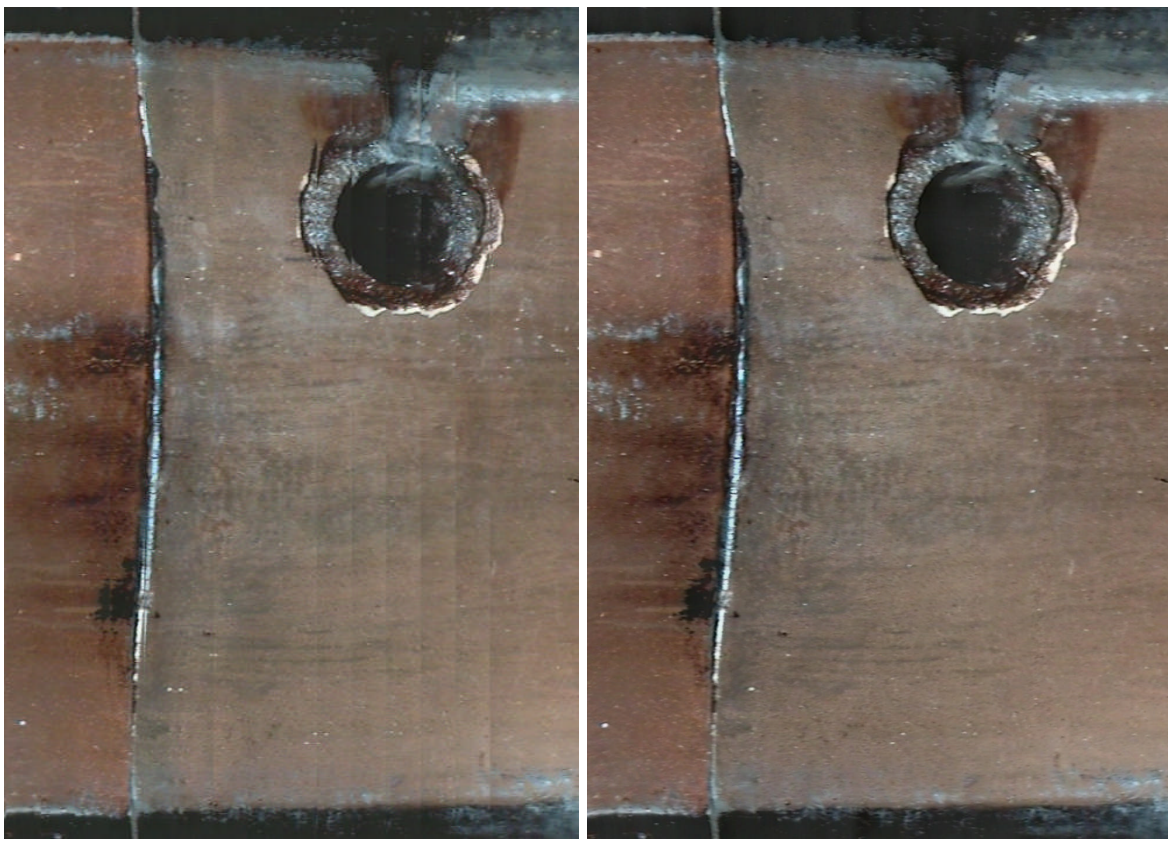


Figure 28: Matching quality before (left) and after the post process (right).

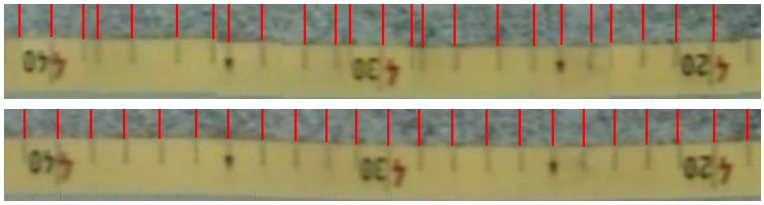


Figure 29: Matching quality detail before (above) and after the post process (below).

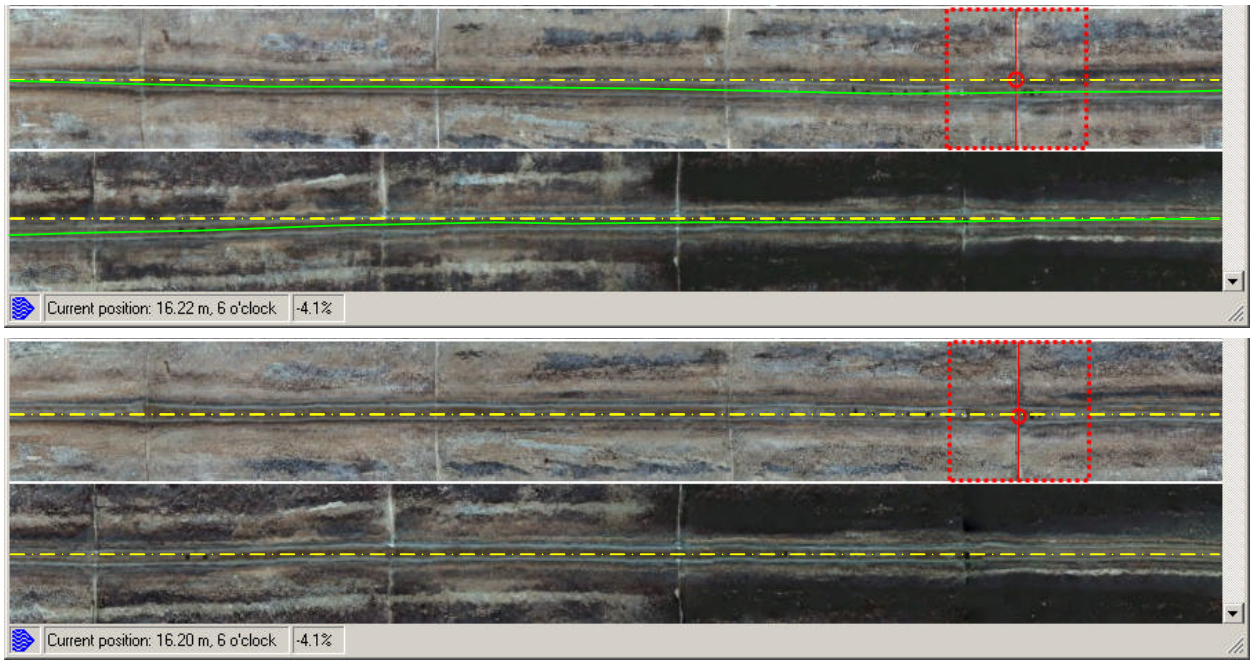


Figure 30: A sidescan overview above before and below after the post process with axial rotation. The yellow line shows the six o'clock bottom line.

If the axial rotation was corrected you will have an additional context menu command *Correct axial rotation* in the frontview that automatically rotates the frontview so that the waterline is again at 6 o'clock:

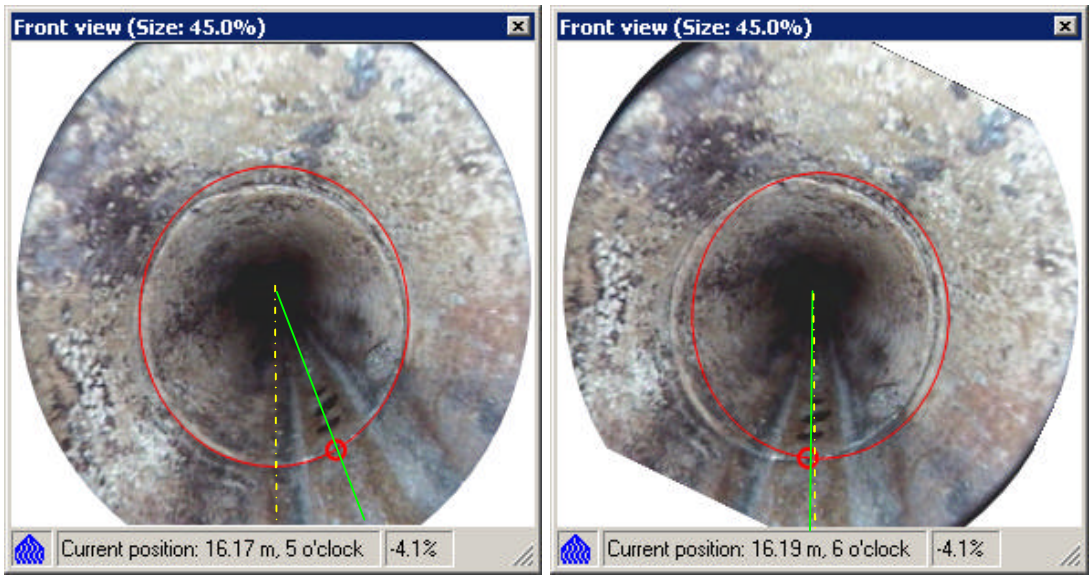


Figure 31: The frontview without (left) and with (right) axial rotation correction at the same position that is shown in the

8 Analysing a Scan

8.1 Starting the WinCan Scan Analyser

With the menu command *File > Start Scan Analyser* or with the button you can start the *WinCan8 Scan Analyser* application:

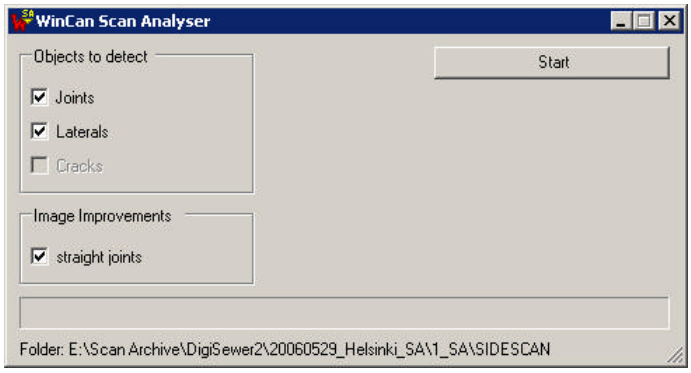


Figure 32: WinCan8 Scan Analyser application window.

The analyser application runs as an independent program witch means that you can continue to work with WinCan8 or the Scan Explorer during the analysis.

At the moment the Scan Analyser is able to detect fully automatically pipe joints and laterals out of the sides-can images only with image processing.

After the analysis the Scan Explorer shows a dialog in witch you can decide how the detected objects should be visualised as graphic objects:

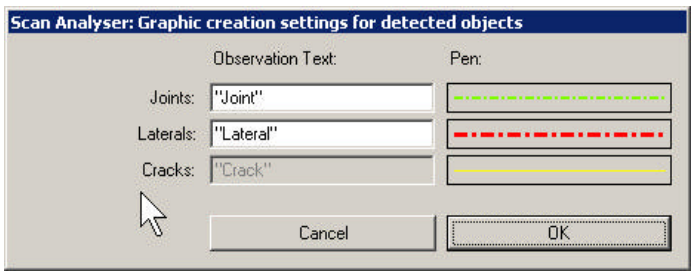


Figure 33: Label & pen settings for the detected objects

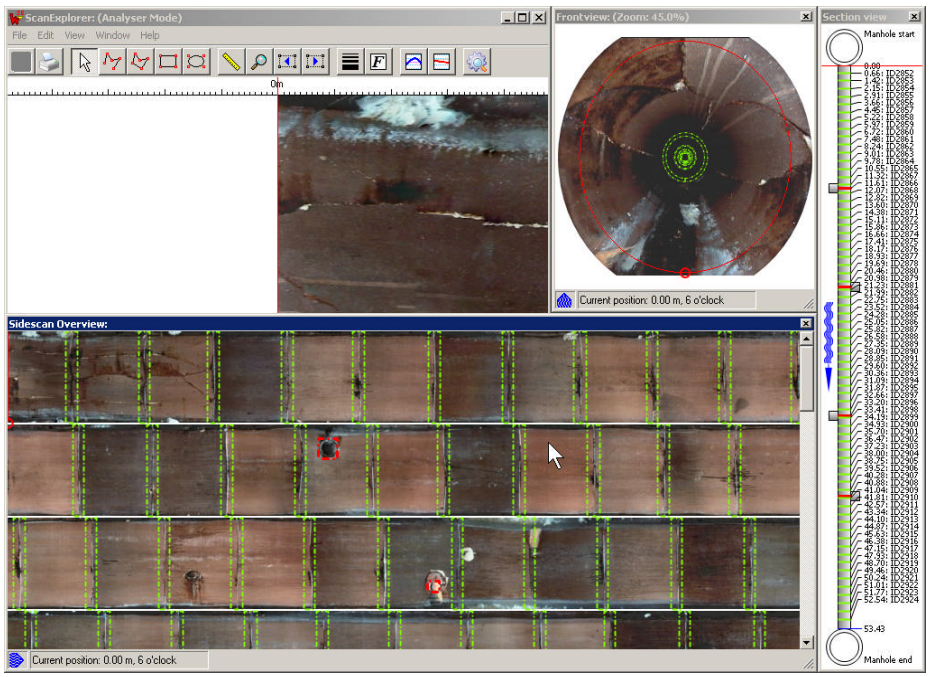


Figure 34: The Scan Explorer with the detected objects.

8.1.1 Scan Analyser: Straighten Joints

If the checkbox *Straighten Joints* is checked the Scan Analyser is able to correct curved joints. Curved joints are generated whenever the scanning camera was not correctly centered during the scan. Because the Scan Analyser is modifying the sidescan images, the scan has to be reloaded once with the ScanExplorer.

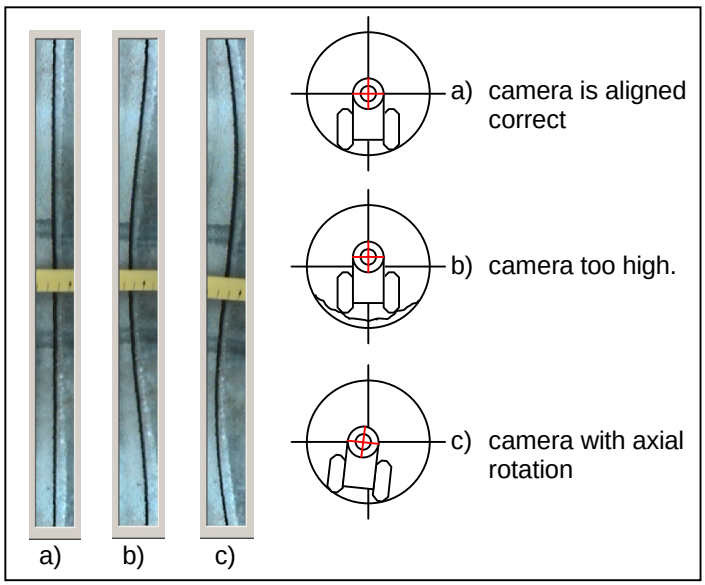


Figure 35: 2 reasons (b & c) for a non-straight joint in a sidescan.

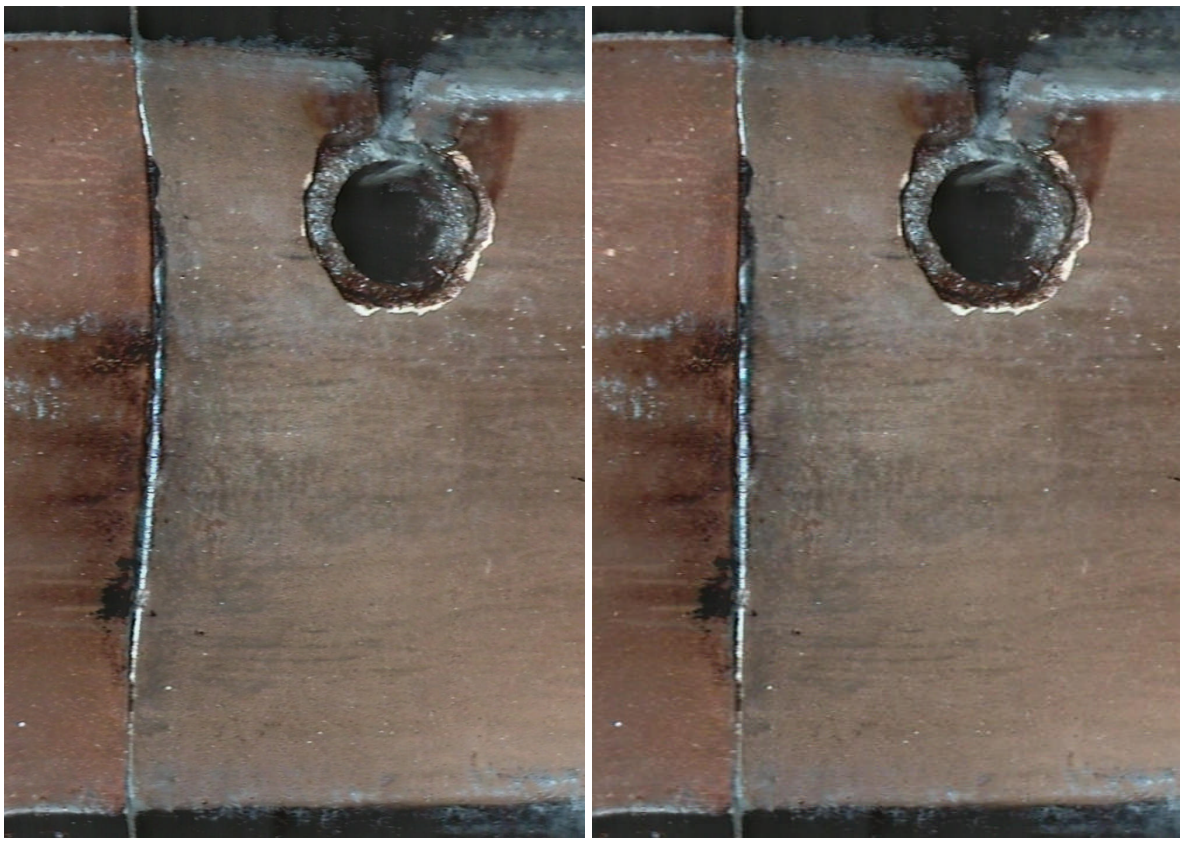


Figure 36: A joint in a sidescan before and after the joint straightening of the Scan Analyser.

9 Menu Commands

9.1 Menu File

9.1.1 Open

This command is only visible in the standalone version of ScanExplorer and lets you open ScanExplorer projects.

9.1.2 Save

With this command you can save a ScanExplorer project. All newly added graphics are stored in the header file of the project. When you close the ScanExplorer window the changes are automatically saved.

9.1.3 Close

This command is only visible in the standalone version of ScanExplorer and lets you close ScanExplorer projects.

9.1.4 Start Scan Analyser

This command starts the WinCan8 ScanAnalyser. See the according chapter for detailed information.

9.1.5 Inspection Information

This command opens the inspection information dialog:

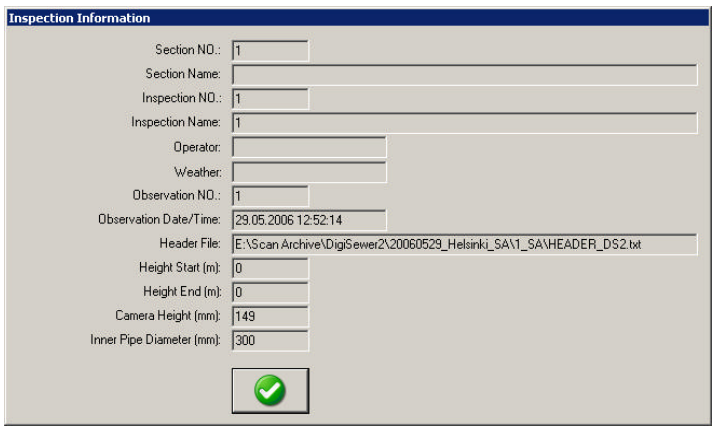


Figure 37: Inspection Information dialog

9.1.6 Start Post Process (only DigiSewer)

If the Post Process was not launched after the scan process you can start the Post Process with this menu command. For more information about the post process see the according chapter in the DigiSewer manual.

9.1.7 Delete old Sidescans (only DigiSewer)

If the Post Process ran after the DigiSewer scanner the old sidescan files can be replaced by the new ones. The old sidescans as well as the sample files (for the stripes) remain in the SIDESCAN folder. These files can be deleted with this menu command. For more information about the post process see the according chapter in the DigiSewer manual.

9.1.8 Print

Opens the graphics report print dialog

9.1.9 Exit

Exits the application.

9.2 Menu Edit

9.2.1 Draw 2D-, 3D-measure, Lines, Polygon, Rectangle or Ellipse

Select a drawing tool. Can be used when the toolbar is hidden.

9.2.2 Delete

Deletes the currently selected graphic without warning.

9.2.3 Delete all graphics

With this command you can delete all graphics from the project. WARNING: This command can not be undone! The according WinCan8 observations are not deleted but set as a standard WinCan observation.

9.2.4 Change Pen

Opens the pen settings dialog in witch you can set the current pen settings.

9.2.5 Change Font

Opens the font settings dialog in witch you can set the current font settings.

9.3 Menu View

9.3.1 Hide all graphics

With this command you can hide all graphics. The graphics are not deleted. They are hidden and a red dashed line is drawn around the sidescan.

9.3.2 Show inclination chart

Shows the inclination chart at the bottom of the main window.

9.3.3 Show height chart

Shows the height chart at the bottom of the main window.

9.3.4 Unit > Meter/Feet

With the sub-command *Meter* all distance measurements are displayed with metric units.
With the sub-command *Feet* all distance measurements are displayed feet and inch.

9.3.5 Zoom

Turns on the zoom tool.

9.4 Menu Navigation

9.4.1 Go to the next graphic

Jumps to the next graphic and selects it.

9.4.2 Go to the previous graphic

Jumps to the previous graphic and selects it.

9.4.3 Go to the scan start

Jumps to the scan start.

9.4.4 Go to the scan end

Jumps to the scan end.

9.4.5 Mouse wheel direction

This menu lets you change the way of how the current position is changed when you pull the mouse wheel.

9.5 Menu Window

9.5.1 Overview Window

With this command you can show the overview window if it was closed before.

9.5.2 Frontview Window

With this command you can show the frontview window if it was closed before.

9.5.3 Sectionview Window

With this command you can show the frontview window if it was closed before.

9.5.4 Panoramo Viewer Window (Panoramo)

With this command you can open and close the Panoramo Viewer window.

9.5.5 Applying a window layout

With this command you can apply a stored layout. You can select a layout from a list that is stored in the WinCanScanExplorer.ini file.

9.5.6 Save the current window layout

With this command you can save the current window positions in the active layout. Changes on windows without using this command afterwards are not stored.

9.5.7 Save as new window layout

With this command you can save the current window positions as a new window layout.

9.5.8 Delete window layout

With this command you can delete a layout from the window layout list. You can not delete the layout with the name “1024x768”.

9.5.9 Bring windows to front together

If this menu item is checked the scan explorer windows are brought to front together if they are e.g. in the background of WinCan.

9.5.10 Move all windows with main window

If this menu item is checked all windows are moved together with the main window.

9.5.11 Show Toolbar

Shows or hides the toolbar in the main window.

9.5.12 Change Language

With this command you change the language of the ScanExplorer user interface.

9.6 Menu Help

9.6.1 About ScanExplorer

With this command you can open the About dialog with copyright and version info.

9.6.2 Show the Quick Help Window

Shows the quick help dialog about the keyboard shortcuts and the mouse interaction.

9.6.3 Open ScanExplorer Documentation (PDF)

With this command you can open this PDF documentation if you have a PDF-reader installed.

9.7 Menu Panoramo

This menu is only available when then the Panoramo Viewer window is open.

9.7.1 Panoramo

This menu command shows the Panoramo settings dialog. Please refer to the original viewer documentation from IBAK.

9.7.2 Help

Show the Panoramo Help file.

10 Appendix

10.1 INI-File Parameters

The INI-file with the name *WinCanScanExplorer.ini* stores some settings of the ScanExplorer.

The original INI-file is placed in the INI-directory within the WinCan8 application directory:

e.g.: *c:\Program files\WinCan v8\WinCan\INI*

At the first start-up and after every update this INI-file is copied to the user directory:

e.g.: *c:\Documents and Settings\{USERNAME}\Application Data\CDLab\WinCan8\INI*

The colors in the list below have the following meaning:

- **Parameter set by WinCan:** The red parameters are set by WinCan if you start the scanner from within WinCan. If you start the scanner standalone you can set these parameters yourself.
- **Parameters manually set:** The black parameters have to be manually set in the INI-file. Most parameters have to rarely set or should not be changed at all.
- **Parameters set by DigiSewer:** The green parameters are set by the DigiSewer scanner application and should not be changed manually.
- **Parameters set by ScanExplorer:** The blue parameters are set by the ScanExplorer and should not be changed manually.

```
[GENERAL]
VERSION=1.50.2510.16496          # ScanExplorer Version used to check if INI-file is depricated
WINDOW_LEFT=206                  # Last windows left position (set by DS)
WINDOW_RIGHT=1074                # Last windows right position (set by DS)
WINDOW_TOP=122                   # Last windows top position (set by DS)
WINDOW_BOTTOM=902                # Last windows bottom position (set by DS)

[HEADER]
SCANAPPLICATION=DS2              # Type of scan app. (set by WC)
LANGUAGE=USA                     # Application Language (set by WC)
DEFAULT_DATA_PATH=D:\WC8Projects\DS1\DigiSewer #Path where the scan will be stored (set by WC)

SECTION_NO=1                     # section auto number (set by WC)
SECTION_NAME=                    # section name (is displayed window titlebar if set)
SECTION_LENGTH=0                 # total length of section in m
SECTION_STARTNODE=               # name of start manhole
SECTION_ENDNODE=                 # name of end manhole
SECTION_FLOW=1                   # flow direction: 1=start>end, 2=end>start
INSPECTION_NO=1                  # inspection auto number (set by WC)
INSPECTION_NAME=1                # inspection name (set by WC)
INSPECTION_WEATHER=Sunshine      # weather condition (set by WC)
INSPECTION_OPERATOR=M. Hudritsch # operator name (set by WC)
INSPECTION_CLEANING=cleaned      # cleaning condition (set by WC)
INSPECTION_DIRECTION=D           # D=downstreams, U=upstreams
INSPECTION_CATALOGUE=obs_pacp.mdb# observation catalogue used for reporting
CONTRACTOR_NAME=Marcus           # contractor name (set by WC) (set by WC)
CONTRACTOR_STREET=Clean 13       # contractor street (set by WC) (set by WC)
CONTRACTOR_CITY=Clean City       # contractor city (set by WC) (set by WC)
CONTRACTOR_TEL=013 313 13 13     # contractor telephone NO. (set by WC)
CONTRACTOR_FAX=013 313 13 12     # contractor fax NO. (set by WC)
CONTRACTOR_EMAIL=m@cleaner.ch    # contractor email adress (set by WC)
OBSERVATION_NO=1                 # observation auto number (set by WC)

UNIT=M                           # unit (M=meter, I=inch)
THUMBNAIL_HEIGHT=100             # height if side scan thumbnails in pixels
GRAYSCALE_HEIGHT=500             # height if side scan grayscale images in pixels
JPEGQUALITY_SS=90                # JPEG quality for side scans  (99 is best, 1 is worst)
JPEGQUALITY_FV=90                # JPEG quality for front views (99 is best, 1 is worst)
BLACKANDWHITE=0                  # 0=show side scan preview in color, 1=show it in b/w
DOUNFOLDLOG=0                    # 0=no log file, 1=log file is written (for development)
SAVESAMPLES=0                    # 0=no stripes saved, 1=stripes are saved
SAMPLEBILINEAR=1                 # (don't change)

OBSERVATION_DATE=03/21/06        # observation date (MM/DD/YY) (set by DS)
OBSERVATION_TIME=08:43:59        # observation time (HH:MI:SS) (set by DS)
DISTANCE_START=5                 # distance start in mm (set by DS)
DISTANCE_END=3825                # distance end in mm (set by DS)
DEPTH_START=0.000000             # depth start in m (set by DS)
DEPTH_END=0.000000               # depth end in m (set by DS)
```

```
[ENCODER]
WHEELDIAMETER=63.662000       # encoder wheel diameter in mm (must be very precise)
IMPPERREV=-20                 # NO. of impulses per revolution of the encoder
INCLINATION_OFFSET=-250       # Distance in mm from current pos to incl. sensor
IMPPERUNFOLD=4                # NO. of impulses per unfold (set by DS)
DISTPERFVMMTARGET=100         # Desired targed distance between frontviews (set by DS)
DISTPERFVMM=90                # Real dist. between FV depends on the dist. per unfold
UNFOLDPERFV=5                 # NO. of unfolds per frontview image (set by DS)
USB_INCL_ISAVAILABLE=1        # 0=no inclination, 1=inclination is stored  (set by DS)
USB_INCL_CHANNEL=2            # USB channel for inclination (set by DS)
USB_INCL_MAX=51669.000000     # USB inclination max. value (set by DS)
USB_INCL_MIN=10813.000000     # USB inclination min. value (set by DS)

[RINGCONFIG]
SAMPLEHEIGHT=1000             # Heigth of side scan image in pixels(max. 1500)
SAMPLEWIDTHMIN=60             # Min. width of unfold stripe
SIDESCANW=2000                # Target width of one big side scan image
UNFOLDDIR=-1                  # undold direction (1 clockwise, -1 counter-clockwise)
SEARCHSTEPS=0                 # if 0 no stripe matching is done (faster) else set it to 3
TOPWIDTH=20                   # (don't change)
CAMERATWIST=0.000000          # (don't change)
FV_INTERVAL=100               # front view interval distance in mm
DIAMETER=150.000000           # Inner pipe diameter in mm (set by DS)
CAMERAHEIGHT=84.000000        # camera height above pipe ground in mm (set by DS)
CENTERX=346.500000            # Center x-coordinate from lower left corner (set by DS)
CENTERY=296.500000            # Center y-coordinate from lower left corner (set by DS)
VIEWRADIUSX=254.500000        # View radius in x-direction (set by DS)
FACTORRY=1.086444             # Factor for the y-view radius (set by DS)
STARTANGLE=270                # start angle in degress (set by DS)
STARTHOUR=6                   # start angle in clock hour (set by DS)
STARTSCANANGLE=51.000000      # (set by DS)
STOREDSETTINGS_01=150mm Concrete Pipe;150;84;12;51.000000   # Stored ring config (set by DS)
STOREDSETTINGS_02=200mm Concrete Pipe;190;100;12;53.500000  # Stored ring config (set by DS)
STOREDSETTINGS_03=300mm Concrete Pipe;350;194;6;52.000000   # Stored ring config (set by DS)
STOREDSETTINGS_04=500mm Clay Pipe;500;273;6;53.000000       # Stored ring config (set by DS)

[CAMERA]
CAMERANAME=IPEK: FUjinon180 NOV05    #Name of camera & lense (don't change)
WIDTH=720                     # front view width in pixels (don't change)
HEIGHT=576                    # front view height in pixels (don't change)
POLY_X3=0.6147                # Camera calibration parameter (don't change)
POLY_X2=1.5845                # Camera calibration parameter (don't change)
POLY_X=257.16                 # Camera calibration parameter (don't change)
POLY_C=0.4275                 # Camera calibration parameter (don't change)

[VIEWER]                      # WinCan ScanExplorer & ScanAnalyser Settings (don't change)
GRAPHIC_WIDTH=3
GRAPHIC_COLOR=-256
GRAPHIC_STYLE=DashDot
GRAPHIC_FONT=Tahoma;10;Bold
INCL_SHOW=False
DEPTH_SHOW=False
DEFAULT_SECT_NAME=Section
DEFAULT_INSP_NAME=Inspection
NEXT_SECT_NO=12
NEXT_INSP_NO=3
MANHOLEDIAMETERPX=40
PRINT_SETTINGS=;;;A4;3;True;25;15;10;10
JOINT_SETTINGS=90;20;2;10;Joint
MAGNETIC_WIDTH=20
WMP_UIMODE=full
WINDOW_LAYOUT_LAST=1024x768
WINDOW_LAYOUT=1024x768;120;0;607;741;False;120;336;902;405;True;False;727;0;295;336;True;False;0;0;1
20;741;True;False;True;True;True
```

10.2 Document History

25-APR-06: Initial version

08-JUN-06: File > Post Process menu commands added.

29-JUN-06: Adapted to version 1.300. New screenshots.

04-JUL-06: WinCan Inclination module info added.

25-JUL-06: Adapted to application version 1.31
Added chapter about media distribution

27-JUL-06: Adapted to application version 1.35

17-AUG-06: Adapted to application version 1.40

30-AUG-06: Adapted to application version 1.41, new chapter 4.5 .

11-OCT-06: More precise installation chapter.

08-NOV-06: Adaptation to application version 1.50, updated chapter for the ScanAnalyser.

15-NOV-06: Adaptation to application version 1.51, updated chapter for the ScanAnalyser.

21-DEC-06: Adaptation to application version 1.60.

14-FEB-07: Adaptation to application version 1.70.

27-FEB-07: Adaptation to application version 1.71.

09-MAR-07: Adaptation to application version 1.72. Added new chapter 2.

20-APR-07: Adaptation to application version 1.74.